Clean Version of Changes Made to Specification

Page 1, lines 9 through 11:

This is a continuation-in-part of U.S. Serial No. 09/542,778 filed April 4, 2000, now abandoned, which is a continuation-in-part of U.S. Serial No. 09/466,701 filed December 17, 1999, now abandoned.

Page 17, line 22 through page 18, line 8:

As mentioned above, the preferred percentages of pores filled with reactant gas and water is dependent upon the size of the pores within the substrate layer and the pressure differential between the reactant gas streams **22**, **24** and the coolant stream. The percentage of pores containing liquid or reactant gas will be controlled by the respective coolant stream **26** and reactant gas **22**, **24** streams, wherein the reactant gas streams **22**, **24** will typically have a greater pressure than the coolant gas stream **26**. Specifically, because the pressure of the reactant gas streams **22**, **24** are typically equal to about ambient pressure, the pressure of the coolant stream **26** is less than ambient pressure. Moreover, the pressure differential between the coolant stream **26** and the reactant gas streams **22**, **24** will typically be in the range of about 0.5 psi to 10.0 psi. It is even more preferable to maintain a pressure differential range of about 1.0 psi to 3.0 psi, and especially preferable to maintain a pressure differential range of about 2.0 psi to 2.5 psi.

Page 22, line 23 through page 23, line 2:

As shown in Fig. **4**, the anode water transport plate **84** is adjacent to the anode support plate **17**, and the cathode water transport plate **86** is adjacent to the cathode support plate **19**. The anode and cathode water transport plates **84**, **86** may be structured and/or oriented to cooperate with adjacent water transport plates **88**, **89** such that the passageways **96** and **98** simultaneously serve as the coolant stream for both the anode of one cell and cathode of the next cell.

Page 24, lines 12 through page 25, line 8:

Referring to Fig. **13**, there is shown an alternative embodiment of the anode and cathode water transport plates in a fuel cell**12a**. Specifically, the water transport plates **84'**, **86'**, **88'** and **89'** illustrated in Fig. **13** contain interdigitated gas passageways **110**, **112**, formed by dividing walls **93**, **93'**, rather than conventional passageways **92** as described in reference to Figs. **4** and **12**. Referring to Fig. **14**, there is shown a side elevation view of the cathode water transport plate **86'** illustrated in Fig. **13** that depicts the flow pattern of the oxidant reactant gas through interdigitated flow channels. The oxidant reactant gas enters the entrance of the entry passageway **110** and moves toward the closed ends **111**, which are obstructed. As the reactant gas moves toward the closed ends **111**, the pressure of the oxidant reactant gas stream forces the oxidant reactant gas into the cathode support plate **19**. After some oxidant is consumed in the cathode support plate **19**, the remaining or unused oxidant reactant gas enters the exit passageways **112** (as shown by the curved arrows in Fig. **14**) and migrates away from the closed ends **113** and is subsequently exhausted from the fuel cell. Because the oxidant reactant gas must pass through the cathode support plate **19** to enter the exit passageway **112**, the mass transfer of oxidant gas from the entry passageway **110** to the cathode support plate **19** increases. The reaction, in turn, increases the electrical performance of the fuel cell, which is described in further detail hereinafter. Although not shown, the interdigitated flow channel configuration for the passageways **110**, **112** in the anode water transport plate **84'** is similar to that for the cathode water transport plate **86'**.

Page 25, line 19 through page 26, line 15:

Referring to Fig. **15**, there is shown an alternative embodiment of the present invention that depicts a fuel cell **12b** having the interdigitated passageways **110**, **112** within the substrate layers **100'**, **102'** rather than in the water transport plates

138, 140, thereby allowing the reactant gas streams to pass directly into and through the substrate layer in lieu of first entering the water transport plates. Specifically, the substrate layers 100', 102' are oriented such that the passageways 110, 112 are adjacent to flat porous water transport plates 138, 140, respectively. Because the interdigitated passageways 110, 112 are within the substrate layers 100', 102' rather then in the water transport plates 138, 140, the water transport plates 138, 140, are flat on the side adjacent the anode and cathode support layers 17', 19'. The opposite side of the water transport plates 138, 140, however, have coolant passageways 134. Additionally, the water transport plates 138, 140 are still porous and allow water to pass therethrough. Although not shown, it is possible for the orientation of the substrate layers 100', 102' to be reversed, such that the passageways 110, 112 are adjacent the diffusion layers 104, 106. Additionally, although Fig. 15 illustrates interdigitated passageways 110, 112 within the substrate layers 100', 102', it is possible that the flow pattern design of the passageways include conventional or serpentine passageways. Regardless of the configuration and/or material construction of the anode and cathode support plates within the fuel cell, the passageways within the water transport plates or substrate layers may be either conventional or interdigitated passageways.

Page 46, lines 7 through lines 12:

Fig. 19 illustrates the high current densities achievable with the fuel cell having the configuration designated by ▲, and interdigitated oxidant flow field. By limiting the stochiometry to below 2.50 (sometimes referred to as 250%), the parasitic power required for moving air through the cell, in an atmospheric PEM fuel cell, is kept to a minimum. Fig. 19 specifically illustrates operation of the fuel cell at a maximum current density of at least 1.6 amps per square centimeter in response to a corresponding electrical load across said fuel cell, and operation of

said fuel cell at current densities of less than 1.6 amps per square centimeter in response to related electrical loads across said fuel cell.